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SUNSHADE HAVING A TIPPING DEVICE

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a tipping device for a sunshade, and
5 more particularly to a sunshade having a tipping device that is used to tip the
sunshade automatically, thereby facilitating a user operating the sunshade.

2. Description of the Related Art

A conventional sunshade comprises a lower rod, an upper rod located
above the lower rod, and a tipping device mounted between the upper rod and
10 the lower rod. Thus, the sunshade is disposed between an upright state and an
inclined state by operation of the tipping device. However, the tipping device is
not operated easily and conveniently, thereby causing inconvenience to a user
when operating and tipping the sunshade.

SUMMARY OF THE INVENTION

15 The primary objective of the present invention is to provide a
sunshade having a tipping device that is used to tip the sunshade automatically,
thereby facilitating a user operating the sunshade.

Another objective of the present invention is to provide a sunshade
that is disposed between an upright state and an inclined state by controlling
20 the lift cord, so that the tipping device is operated easily and conveniently,
thereby facilitating the user operating and tipping the sunshade.

In accordance with the present invention, there is provided a sunshade, comprising a hollow lower rod, a hollow upper rod located above the lower rod, and a tipping device mounted between the upper rod and the lower rod, wherein:

5 the tipping device includes a lower connector, an upper connector, a connecting lever, a drive plate, a tensile spring, and a slide, wherein:

 the lower connector has a lower end secured on an upper end of the lower rod and an upper end having a first side formed with a protruding support block and a second side formed with a receiving recess;

10 the upper connector has an upper end secured on a lower end of the upper rod and a lower end pivotally mounted on the upper end of the lower connector;

 the connecting lever is mounted in the upper rod and the upper connector and has a lower end pivotally mounted on the support block of the
15 lower connector;

 the drive plate is pivotally mounted on a mediate portion of the upper rod and has a first end pivotally mounted on an upper end of the connecting lever;

 the tensile spring is mounted in the upper rod and has a first end
20 secured on the upper end of the connecting lever and a second end secured on an upper end of the upper rod; and

the slide is slidably mounted on the upper rod and the lower rod and is movable to press the drive plate so as to move and pivot the drive plate.

Further benefits and advantages of the present invention will become apparent after a careful reading of the detailed description with appropriate
5 reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a partially cut-away plan view of a sunshade in accordance with the preferred embodiment of the present invention;

Fig. 2 is a partially enlarged cross-sectional view of the sunshade as
10 shown in Fig. 1;

Fig. 3 is a partially exploded perspective view of the sunshade as shown in Fig. 1;

Fig. 3A is a perspective view of an upper connector of the sunshade as shown in Fig. 3;

15 Fig. 4 is a partially exploded perspective view of the sunshade as shown in Fig. 1;

Fig. 5 is a schematic operational view of the sunshade as shown in Fig. 1; and

Fig. 6 is a schematic operational view of the sunshade as shown in
20 Fig. 2.

DETAILED DESCRIPTION OF THE INVENTION

Referring to the drawings and initially to Figs. 1-4, a sunshade in accordance with the preferred embodiment of the present invention comprises a hollow lower rod "a", a hollow upper rod "b" located above the lower rod "a", and a tipping device mounted between the upper rod "b" and the lower rod "a".

5 The tipping device includes a lower connector 1, an upper connector 2, a connecting lever 3, a drive plate 4, a tensile spring 5, and a slide 6.

 The lower connector 1 has a lower end secured on an upper end of the lower rod "a". The lower connector 1 has an upper end having a first side formed with a protruding support block 11 and a second side formed with a receiving recess 12. The support block 11 of the lower connector 1 is substantially U-shaped and has an inside formed with a receiving chamber 112 and two side walls each formed with a pivot hole 111 communicating with the receiving chamber 112. The receiving recess 12 of the lower connector 1 has two sides each formed with a pivot bore 121 communicating with the receiving
10 recess 12.
15 recess 12.

 The upper connector 2 is a hollow body and has an upper end secured on a lower end of the upper rod "b" and a lower end pivotally mounted on the upper end of the lower connector 1. The lower end of the upper connector 2 has a first side formed with a protruding pivot seat 21 pivotally mounted in the receiving recess 12 of the lower connector 1. The pivot seat 21 of the upper
20 connector 2 is formed with a pivot hole 211. A pivot shaft 14 is extended through the pivot bore 121 of the receiving recess 12 of the lower connector 1

and the pivot hole 211 of the pivot seat 21 of the upper connector 2, so that the upper connector 2 is pivotally mounted on the lower connector 1. The lower end of the upper connector 2 has a second side formed with an insertion recess 22 (see Fig. 3A), and the support block 11 of the lower connector 1 is mounted
5 in the insertion recess 22 of the upper connector 2.

The connecting lever 3 is mounted in the upper rod “b” and the upper connector 2 and has a lower end 30 pivotally mounted on the support block 11 of the lower connector 1. The lower end 30 of the connecting lever 3 is pivotally mounted in the receiving chamber 112 of the support block 11 of the
10 lower connector 1. The lower end 30 of the connecting lever 3 is formed with an oblong slot 301. A pivot axle 16 is extended through the pivot hole 111 of the support block 11 of the lower connector 1 and the oblong slot 301 of the lower end 30 of the connecting lever 3, so that the lower end 30 of the connecting lever 3 is pivotally mounted on the support block 11 of the lower
15 connector 1.

The drive plate 4 is pivotally mounted on a mediate portion of the upper rod “b” and has an end 40 pivotally mounted on an upper end 32 of the connecting lever 3. The drive plate 4 has an inside formed with an elongated slot 41 for mounting the upper end of the connecting lever 3. Preferably, the
20 upper rod “b” has a peripheral wall formed with an opening “b3” (see Fig. 2) for passage of the drive plate 4. A retaining ring “b2” is mounted on the mediate portion of the upper rod “b” and the drive plate 4 is movable to press

the retaining ring “b2”, so as to limit movement of the drive plate 4 by the retaining ring “b2”.

The tensile spring 5 is mounted in the upper rod “b” and has a first end secured on the upper end of the connecting lever 3 and a second end secured on an upper end of the upper rod “b”.

The slide 6 is slidably mounted on the upper rod “b” and the lower rod “a” and has an inside formed with a mounting hole 60 mounted on the upper rod “b” and the lower rod “a”. Preferably, the slide 6 is located on a connection of the upper connector 2 and the lower connector 1 as shown in Fig. 2, so that the upper connector 2 is fixed on the lower connector 1 to form a linear state. The slide 6 is substantially inverted T-shaped and has a top face formed with a locking recess 63. A push block 64 is mounted on the slide 6 to move therewith and is movable to press the drive plate 4 so as to move and pivot the drive plate 4. Preferably, the push block 64 has a lower portion secured in the locking recess 63 of the slide 6.

The sunshade further comprises a plurality of stretchers 62 each having a first end pivotally mounted on the slide 6, a plurality of ribs 620 each having a first end pivotally mounted on a second end of a respective one of the stretchers 62 and a second end pivotally mounted on the upper end of the upper rod “b”, a pulley “b1” mounted in the upper end of the upper rod “b”, a crank “a1” rotatably mounted on a mediate portion of the lower rod “a”, and a lift cord “a2” mounted in the upper rod “b” and the lower rod “a” and having a first

end secured on the crank “a1” and a second end reeved through the pulley “b1”, extended outward from the upper end of the upper rod “b”, extended through the elongated slot 41 of the drive plate 4 and secured on the slide 6 to move the slide 6 upward and downward. Preferably, the slide 6 has a periphery formed with a plurality of pivot channels 61 for mounting the stretchers 62. Preferably, the second end of the tensile spring 5 is secured on the pulley “b1”.

In operation, referring to Figs. 1-6, the slide 6 is located on the connection of the upper connector 2 and the lower connector 1, so that the upper connector 2 is fixed on the lower connector 1 to form a linear state as shown in Figs. 1 and 2. Thus, the upper rod “b” and the lower rod “a” form a linear state, so that the sunshade is disposed at an upright state as shown in Fig. 1.

When the crank “a1” is rotated, the lift cord “a2” is wound around the crank “a1” successively to move the slide 6 upward, so that the slide 6 is moved from the position as shown in Figs. 1 and 2 to the position as shown in Figs. 5 and 6, thereby releasing the upper connector 2 from the lower connector 1. At this time, the push block 64 is moved with the slide 6 to press the drive plate 4 so as to move and pivot the drive plate 4 upward, thereby indirectly acting on the connecting lever 3 located between the tensile spring 5 and the lower connector 1, so as to move the connecting lever 3, so that the upper connector 2 is detached from and pivoted relative to the lower connector 1 by the gravity of the stretchers 62 and ribs 620, thereby forming an inclined state

between the upper connector 2 and the lower connector 1 as shown in Figs. 5 and 6. Thus, the upper rod “b” is inclined relative to the lower rod “a”, so that the sunshade is disposed at an inclined state as shown in Fig. 5. In addition, the retaining ring “b2” mounted on the mediate portion of the upper rod “b” is used to limit excessive movement of the drive plate 4.

When the lift cord “a2” is loosened, the slide 6 is lowered to move the push block 64 downward, thereby detaching the drive plate 4 from the push block 64, so that the connecting lever 3 is loosened. Then, the connecting lever 3 is returned to the original state by the restoring force of the tensile spring 5, so that the upper connector 2 is pivoted toward and rested on the lower connector 1, thereby forming a linear state between the upper connector 2 and the lower connector 1. At this time, the slide 6 is returned to the original position and located on the connection of the upper connector 2 and the lower connector 1, so that the upper connector 2 is fixed on the lower connector 1 to form the original linear state as shown in Figs. 1 and 2. Thus, the upper rod “b” and the lower rod “a” form the original linear state, so that the sunshade is disposed at an upright state as shown in Fig. 1.

Accordingly, the sunshade is disposed between an upright state and an inclined state by controlling the lift cord “a2”, so that the tipping device is operated easily and conveniently, thereby facilitating a user operating and tipping the sunshade.

Although the invention has been explained in relation to its preferred embodiment(s) as mentioned above, it is to be understood that many other possible modifications and variations can be made without departing from the scope of the present invention. It is, therefore, contemplated that the appended
5 claim or claims will cover such modifications and variations that fall within the true scope of the invention.